

REMARKS/ARGUMENTS

Status of Claims

Claims 1-7 and 9-22 are pending. Claims 1, 2, 3, 4, 5, 9 and 14 are currently amended. Claim 8 is cancelled. No new matter is introduced.

Formal Matters

Applicants thank the Examiner for accepting the drawings filed on September 26, 2006, acknowledging that all certified copies of the priority documents have been received, entering the preliminary amendment filed on February 21, 2006 and considering the information disclosure statements filed on July 19, 2007 and September 6, 2006.

Examiner Interview

Applicants thank the Examiner for the interview conducted on February 20, 2008. During the interview, Applicants inquired about the IDS and a lack of art disposition for claims 2-7 and 9-22. Examiner confirmed that claims 2-7 and 9-22 were not rejected in the office action and may be allowable, based on further consideration.

Claim 2-7 and 9-22 are Allowable

The Examiner fails to provide an art disposition for claims 2-7 and 9-22. Applicants respectfully submit that these claims are allowable.

The office action fails to reject or object to claims 2-7 and 9-22. Under 37 CFR § 1.104(c)(1), if the invention is not considered patentable, the invention will be rejected. Thus, Applicants submit that under § 1.104(c)(1), claims 2-7 and 9-22 are considered to be patentable and should have been allowed. Applicants addressed these deficiencies with the Examiner during the interview on February 20, 2008 and the Examiner stated that claims 2-7 and 9-22 may be allowable. Accordingly, Applicants request that claims 2-7 and 9-22 be allowed.

Furthermore, according to MPEP § 707(i), each office action should mention each pending claim and include a status of all claims presented for examination. Applicants submit that since the office action is incomplete, in this regard, as to claims 2-7 and 9-22 and if the application is not passed for allowance, then the Examiner provide and issue the next office action as non-final so that Applicants have an opportunity to respond.

Furthermore, Applicants respectfully submit that claims 2-7 and 9-22 are allowable at least because they depend from allowable claim 1, as currently amended. Additionally, claims 2-7 and 9-22 are allowable over the cited references.

Applicants' Comments on Rejection of Claim 1

Applicants respectfully submit that the rejection is improper.

According to MPEP § 707.07(g), a rejection should be stated with a full development of reasons rather than by a mere conclusion. For the present application, the rejections of claim 1 do not provide any reason, only conclusions. Therefore, Examiner's reasons for rejecting claim 1 are unclear as to the portions of the cited references the Examiner relies upon to support the rejections.

Accordingly, Applicants respectfully request that if the Examiner does not pass the application for allowance, then the Examiner provide detailed reasons for the rejections, and issue the next office action as non-final so that Applicants have an opportunity to respond.

Correction to the Specification and Claims

The Examiner objected to the disclosure because the Examiner finds the spacing of the lines of the written specification, including the abstract, to be difficult to read, and required a substitute specification with lines 1 ½ or double spaced with paragraph numbers. Accordingly, Applicants submit herewith a substitute specification (including the abstract) with lines 1 ½ spaced and paragraph numbers. Corrections to the claims are reflected in the listing of claims, herewith.

The Examiner suggested checking the specification for proper English language spelling and grammar. Accordingly, Applicants amend the specification to conform to English language spelling and grammar.

The Examiner required amending the abstract of the disclosure to remove specified words. Accordingly, Applicants amend the abstract.

Applicants respectfully request the Examiner to withdraw the objection to the disclosure.

Further, the Examiner objected to claims 1-22.

Applicants amend claims 1, 2, 4 and 14 to overcome Examiner's objections.

Withdrawal of the objections is respectfully requested.

Claim for Priority

Applicants thank the Examiner for suggesting amending the specification to include a reference to the prior-filed application in compliance with 37 CFR 1.78(a) in the first sentence(s) of the specification. Accordingly, Applicants amend the specification to include a reference to the prior-filed application.

Rejection of claims 1 and 8 under 35 USC § 102(b) as being anticipated by Xiong et al (US 6,434,265 B1)

Claims 1 and 8 are rejected as being clearly anticipated by Xiong.

By the present amendments, claim 1 has been amended to overcome the rejection, while claim 8 has been cancelled.

An invention is anticipated if the same device, including all the claim limitations, is shown in a single prior art reference. Every element of the claimed invention must be literally present, arranged as in the claim. The identical invention must be shown in as complete detail as is contained in the patent claim. See MPEP § 2131.

Claim 1, as amended, recites *an image reconstruction method from electrical capacitance tomography data comprising: (a) obtaining the measurement electrical capacitance tomography data by using a recording sensor formed by an array of electrodes located on the perimeter of an oil-pipe, well or tank; (b) processing said measurement data using the Method of Simulated Annealing for the estimation of an electrical permittivity distribution image; and (c) displaying said processed image on a display device in order to visualize multiphase oil-flows through a cross section of a pipe, well or tank.*

Xiong merely discloses “image registration”, which is the process of combining several images to obtain a new image with improved quality and resolution, and further discloses processing images to obtain another image. In contradistinction thereto, Applicants’ claimed embodiments relate to “image reconstruction”, which involves construction of an image from processing of raw measurement data to obtain an image of a physical property, as described in claim 1 (see above). Xiong, in column 2, lines 1-24 discloses global optimization of images for creating a full 360-degree panorama by registering all images, calibrating the parameters of images through global optimization and re-projecting all images onto a panorama.

Xiong fails to disclose or suggest *(a) obtaining the measurement electrical capacitance tomography data by using a recording sensor formed by an array of electrodes*

located on the perimeter of an oil-pipe, well or tank; (b) processing said measurement data using the Method of Simulated Annealing for the estimation of an electrical permittivity distribution image, as recited in claim 1. Additionally, Xiong fails to disclose an using simulated annealing for pipe-flow visualization from capacitance tomography data.

Accordingly, claim 1 is allowable over Xiong.

Rejection of claims 1 and 8 under 35 USC § 102(e) as being anticipated by Castro-Pareja et al (US 7,280,710 B1)

Claims 1 and 8 are rejected as being clearly anticipated by Castro-Pareja.

By the present amendments, claim 1 has been amended to overcome the rejection, while claim 8 has been cancelled.

Castro-Pareja merely discloses “image registration”, which is the process of combining several images to obtain a new image with improved quality and resolution, and further discloses processing images to obtain another image. In contradistinction thereto, Applicants’ claimed embodiments relate to “image reconstruction”, which involves construction of an image from processing of raw measurement data to obtain an image of a physical property, as described in claim 1 (see above). Castro-Pareja, in column 2, lines 5-15, discloses a real-time image registration utilizing obtained image values. Castro-Pareja, in column 8, lines 46-51, utilizes nonlinear optimization algorithm to find transformation parameters that maximize voxel similarity. Additionally, Castro-Pareja does not disclose or suggest features relating to pipelines, tanks, wells and gases.

Castro-Pareja fails to disclose or suggest *(a) obtaining the measurement electrical capacitance tomography data by using a recording sensor formed by an array of electrodes located on the perimeter of an oil-pipe, well or tank; (b) processing said measurement data using the Method of Simulated Annealing for the estimation of an electrical permittivity distribution image, as recited in claim 1. Additionally, Castro-Pareja fails to disclose using simulated annealing for pipe-flow visualization from capacitance tomography data.*

Accordingly, claim 1 is allowable over Castro-Pareja.

Rejection of claims 1 and 8 under 35 USC § 102(b) as being anticipated by Zhu et al (US 6,775,405 B1)

Claims 1 and 8 are rejected as being clearly anticipated by Zhu.

By the present amendments, claim 1 has been amended to overcome the rejection, while claim 8 has been cancelled.

Zhu merely discloses "image registration", which is the process of combining several images to obtain a new image with improved quality and resolution, and further discloses processing images to obtain another image. In contradistinction thereto, Applicants' claimed embodiments relate to "image reconstruction", which involves construction of an image from processing of raw measurement data to obtain an image of a physical property, as described in claim 1 (see above).

Zhu discloses in column 2, lines 56-67, image registration and optimization by using transformation defining a geometric relationship of a second image relative to the first image using estimates. Zhu, in column 5, lines 53-58 discloses a matrix that is displayed to align two images and display the composite image. Zhu does not disclose or suggest features relating to pipelines, tanks, wells and gases.

Zhu fails to disclose or suggest *(a) obtaining the measurement electrical capacitance tomography data by using a recording sensor formed by an array of electrodes located on the perimeter of an oil-pipe, well or tank; (b) processing said measurement data using the Method of Simulated Annealing for the estimation of an electrical permittivity distribution image*, as recited in claim 1. Additionally, Zhu fails to disclose using simulated annealing for pipe-flow visualization from capacitance tomography data.

Accordingly, claim 1 is allowable over Zhu.

Conclusion

In view of the above, it is believed that the above-identified application is in condition for allowance, and notice to that effect is respectfully requested. Should the Examiner have any questions, the Examiner is encouraged to contact the undersigned at the telephone number indicated below.

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Respectfully submitted,



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